

REMARKS

Claims 8-14 are rejected over a primary reference, Mecklenborg et al, either alone or in combination with other references. All of the rejections are under 35 U.S.C. § 103(a).

Reconsideration and withdrawal of these rejections is respectfully requested in view of the following discussion. Claim 8 has been rewritten to incorporate the subject matter of claim 10 which has now been cancelled to further distinguish applicants' invention from this and other references.

Applicants' sole independent claim, claim 8, is directed to an optical system, such as for a fundus camera, which has a substantially coaxial illumination beam path and imaging beam path. The optical system comprises a lens system of at least four lenses, at least two lenses of these at least four lenses being tilted with respect to their optical axes relative to the illumination beam path and imaging beam path, the optical axes of said two lenses and optical axis of the illumination beam path and imaging beam path lying in a first plane, at least two other lenses of the at least four lenses being tilted with respect to their optical axes relative to the illumination beam path and imaging beam path, and the optical axes of the two other lenses and optical axis of the illumination beam path and imaging beam path lying in a second plane which intersects the first plane substantially along the optical axis of the illumination beam path and imaging beam path. As now set forth, claim 8 also requires that the optical axis of the illumination beam path and imaging beam path penetrate the lens outside their optical axes.

The Mecklenborg patent, entitled "Revolutionary Scheimpflug Visual Probe," is not directed to a fundus camera, and the optical system therein differs substantially from that which

is required in an optical fundus camera. Accordingly, Mecklenborg is not a viable reference against applicants' claimed invention and the rejections are not supported. Applicants' specification properly notes that Humphrey (U.S. Patent No. 4,730,910) is a relevant prior art disclosure, but Mecklenborg is not. As stated in applicants' specification, the primary object of the present invention is to overcome the disadvantages of the prior art and to provide an optical system for a fundus camera which effectively eliminates flare at the optical surfaces from the imaging beam path and ensures extensive imaging stability. Other aspects of the invention are set forth on page 3, paragraphs [0012], [0013] and [0014] which are relevant for an optical system for a fundus camera. In comparing the requirements of an optical system for a fundus camera with the Mecklenborg disclosure for a Scheimpflug visual probe, the latter does not have the following:

1. Between the tilted lenses 1, 2, 3 and 4 of the optical system for the fundus camera, no intermediate images are produced. In Mecklenborg, one intermediate image is located between the relay lenses B+C and D+E (column 7, lines 45-50).

2. In the claimed system for a fundus camera, two of four lenses are lying in a first plane. Two other lenses are lying in a second plane. The first and second plane extend substantially perpendicular to one another, as set forth in claim 9. In Mecklenborg's Scheimpflug probe relay lens B and relay lens C are lying in one plane only (column 7, lines 5-8). If one relay lens is tilted and the second relay lens is tilted in the opposite direction, then both of them are lying in the same plane.

3. In Figs. 1 and 2 of the present application, the object is located on the optical axis

5, but the image is off axis. Mecklenborg's Scheimpflug probe contains pairs of relay lenses. An object of the system axis will be imaged on that axis (column 7, lines 8 and 9) by these relay lenses.

4. All lenses of the optical system for a fundus camera are tilted, however, they are fixed in their position. There is no movement between the elements. An essential feature of Mecklenborg's Scheimpflug probe is to revolve the relay lenses (see claim 1). Without revolving the Scheimpflug relay lenses, erecting the image does not work.

5. The lenses 1, 2, 3 and 4 of the system for a fundus camera are tilted. Every single lens is tilted with different angles (see page 2, section [0027]). Every relay lens A, B, C and D of Mecklenborg's Scheimpflug probe are tilted, but inside a single relay lens every surface is on the optical axis of the relay lens itself. There is no disclosure about additional tilts in the relay lens.

6. There are no field lenses in the system for a fundus camera (according to Photonics Dictionary: Field lens is a lens situated at or near the plane of an internal image to project the aperture of a previous objective or erector upon the aperture of a following lens). After every relay lens, a field lens is located in Mecklenborg's Scheimpflug probe. These are called x, y and z in Fig. 7.

7. In the system for a fundus camera in the present application, an optical axis 5 is defined. This axis is perpendicular to the object plane. The chief ray which starts from the object plane on axis and propagates surface by surface to the image and is not parallel to the optical axis after hitting lens 1. The optical axis of Mecklenborg's Scheimpflug probe is parallel to the system axis between the relay lens B and relay lens C. Between relay lens D and relay

lens E, the optical axis is parallel to the system axis as well.

Based on the above comparison, it is believed that Mecklenborg is an inapposite reference and would be so understood by one of ordinary skill in the art.

Notwithstanding the above argument, applicants have also amended claim 8 to add the subject matter of claim 10, i.e., "and wherein the optical axis of the illumination beam path and imaging beam path penetrates the lens outside their optical axes." In this respect, it is believed that the Examiner has made an incorrect statement with regard to the rejection of claim 10; in Mecklenborg, the beam path intersects the optical axis of the lenses, B, C, D and E, as can be clearly seen in Fig. 7. There is no suggestion or disclosure in Mecklenborg with regard to this feature and, accordingly, the amended claim 8 should be allowable over Mecklenborg for this point alone.

There are yet other distinguishing features from Mecklenborg. In particular, Mecklenborg is not able to avoid flare and reflexes entering the image beam path – this is only the case when the beam does not travel through the center of the lens (when the lens is outside the center by the light beam, the reflex is directed outside the beam path).

Other references mentioned by the Examiner include Howell which teaches normal lenses built up from different segments (made of different glasses). It does not teach the use of "incomplete" lens segments as described in the present application.

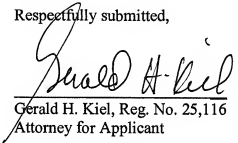
Humphrey, also referred to by the Examiner in connection with claim 13, is a relevant reference, however, in the present application the second lens pair is tilted within a second plane to patentably distinguish over Humphrey. This results in a balanced correction and much better

imaging characteristics.

Based on the above, it is believed that claims 8, 9 and 11-14, as amended, clearly and patentably distinguish over the cited art. In addition, it is submitted that Mecklenborg is not an appropriate reference and should not be considered in the present examination.

This application is now in condition for allowance which action is respectfully requested. In addition, applicants further request that if the amendment is not entered for purposes of allowance, it should be entered for purposes of appeal.

Respectfully submitted,



Gerald H. Kiel, Reg. No. 25,116
Attorney for Applicant

Reed Smith LLP
599 Lexington Avenue
29th Floor
New York, NY 10022-7650
Tel.: (212)521-5400
GHK/jl